

**Claims**

1. A burner (1) for a vapour deposition process, having a central nozzle (10) for ejecting a glass precursor material, characterized in that said central nozzle (10) has a concave shape.  
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2. A burner according to claim 1, wherein said central nozzle (10) has a symmetry about an axial plane.
- 10 3. A burner according to claim 1, further comprising at least a crown of nozzles (31, 32) surrounding said central nozzle (10) for ejecting a flame reactant.
- 15 4. A burner according to claim 1, further comprising a circular nozzle (20) between said central nozzle (10) and said crown of nozzles (31, 32) for ejecting an innershield gas.
- 20 5. A burner according to claim 4, wherein said central nozzle (10) has first angular sectors (10a) of minimum radial dimensions and second angular sectors (10b) of maximum radial dimensions.
- 25 6. A burner according to claim 5, wherein said at least a crown of nozzles (31) comprises a first set of nozzles (31a) in the same angular positions of said second angular sectors (10b) and a second set of nozzles (31b) in the same angular positions of said first angular sectors (10a).
7. A burner according to claim 6, further comprising a first set of orifices exiting in said first set of nozzles (31a) and a second set of orifices exiting in said second set of nozzles (31b), the orifices of the first set being inclined of a first angle with respect to a central axis (5) of said burner and the  
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orifices of the second set being inclined of a second angle with respect to said central axis, said second angle being greater than said first angle.

8. A burner according to claim 1, having a central duct (101) exiting in said central nozzle (10) for the passage of said glass precursor material, and comprising a central member (70) positioned inside the central duct (101) for forcing the glass precursor material toward the external boundary of said central nozzle (10).  
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- 10 9. A burner according to claim 8, wherein the central member (70) has at least an enlarged portion that substantially fits with external walls (102) of said central duct (101).  
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10. A chemical vapor deposition process, comprising ejecting a stream of glass precursor material having a concave cross section.  
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11. A process according to claim 10, further comprising producing a flame around said stream of glass precursor material and ejecting an innershield gas between said stream of glass precursor material and said flame.  
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12. A process according to claim 10, wherein said stream of glass precursor material has a central axis, wherein said cross-section has first angular zones of maximum radial extension alternated to second angular zones of minimum radial extension, and wherein producing a flame comprises ejecting combustible gases along a first direction with respect to said axis at first angular positions corresponding to said first angular zones and along a second direction with respect to said axis at second angular positions corresponding to said second angular zones, said second angle being greater than said first angle.  
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13. A process according to claim 10, wherein said stream of glass precursor material is ejected with a velocity that is maximum in a region around a central axis of said stream.